

What Is Claimed Is:

1. An asymmetrically accelerated vibrator comprising:
  - a case having a first bore and a second bore arranged in coaxial relation to one another and in regulated fluid communication with a source of compressed fluid;
  - a first piston having a first diameter disposed in said first bore;
  - a second piston having a second diameter disposed in said second bore;
  - a mechanical connection between said first and second pistons such that said pistons are caused to oscillate in unison by regulated application of compressed fluid from said compressed fluid source; and
  - a ball-valve disposed in fluid regulatory relation between said first bore, said second bore, and said source of compressed fluid so as to switch a flow of said compressed fluid between said first bore and said second bore upon interaction with a portion of said second piston.
2. An asymmetrically accelerated vibrator according to claim 1 wherein a compressed fluid conduit is defined within said case, and arranged in fluid communication between a compressed fluid intake port and a threaded recess that is defined in said case.

3. An asymmetrically accelerated vibrator according to claim 2 wherein said threaded recess is sized and shaped to receive a substantially a spherical ball-valve.

4. An asymmetrically accelerated vibrator according to claim 2 wherein said threaded recess is sized and shaped to receive a correspondingly threaded stem.

5. An asymmetrically accelerated vibrator according to claim 1 wherein said ball-valve is formed from a light weight, wear and corrosion resistant material.

6. An asymmetrically accelerated vibrator according to claim 4 wherein said threaded stem includes a radiused bottom end and a central passageway arranged in fluid communication with an opening located within threads disposed upon an outer surface and a semi-circumferential slot which intersects with said opening.

7. An asymmetrically accelerated vibrator according to claim 6 wherein said threaded recess comprises a radiused seat-wall having a centrally defined through-bore that provides for fluid communication with a central passageway defined in the interior of said threaded stem.

8. An asymmetrically accelerated vibrator according to claim 7 wherein said radiused seat-wall comprises a curvature that is complementary to a spherical ball-valve.

9. An asymmetrically accelerated vibrator according to claim 2 wherein said first bore and said second bore are arranged in spaced apart coaxial relation to one another, and in substantially parallel relation to said compressed fluid conduit.

10. An asymmetrically accelerated vibrator according to claim 2 wherein said first bore comprises a smaller diameter than said second bore, and a feed-bore fluidly communicates between said compressed fluid conduit and said first bore, and in spaced relation to said threaded recess.

11. An asymmetrically accelerated vibrator according to claim 7 wherein said through-bore of said threaded recess communicates with said first bore upon movement of said ball-valve.

12. An asymmetrically accelerated vibrator according to claim 1 wherein an open-ended passageway is defined in a lower portion of said case, and is disposed in substantially parallel, spaced relation to said first and second bores, and an exhaust-bore is defined in said case adjacent to an end of said open-ended

passageway so as to fluidly communicate between said second bore and said open-ended passageway.

13. An asymmetrically accelerated vibrator according to claim 1 wherein said second piston includes a valve positioned within said second bore, and comprising a substantially cylindrical, open-ended profile defined by an annular outer wall and a bottom wall.

14. An asymmetrically accelerated vibrator according to claim 13 wherein said annular outer wall includes a lead-in portion having an outer surface and a ball-valve-actuator that projects radially outwardly from said outer surface.

15. An asymmetrically accelerated vibrator comprising:

- a case having a first open-ended chamber and a second open-ended chamber arranged in coaxial relation to one another and in regulated fluid communication with a source of compressed fluid;
- a first piston having a first diameter disposed in said first open-ended chamber;
- a second piston having a second diameter disposed in said second open-ended chamber;
- a compressed fluid conduit defined within said case and arranged in fluid communication between a compressed fluid intake port and a threaded recess that

is defined in said case between said first open-ended chamber and said second open-ended chamber wherein said threaded recess is terminated by a radiused seat-wall having a through-bore that opens into said second open-ended chamber;

a mechanical connection between said first and second pistons such that those pistons are caused to oscillate in unison by regulated application of compressed fluid from said compressed fluid source; and

a ball-valve disposed in said threaded recess such that when said ball-valve is engaging said seat-wall, a segment of said ball-valve projects into said second open-ended chamber so as to be engagable by a portion of said second piston and thereby to provide fluid regulation between said first open-ended chamber, said second open-ended chamber, and said source of compressed fluid so as to switch a flow of said compressed fluid between said first open-ended chamber and said second open-ended chamber upon interaction of said segment with said portion of said second piston.

16. An asymmetrically accelerated vibrator according to claim 15 wherein said threaded recess is sized and shaped to receive a substantially a spherical ball-valve.

17. An asymmetrically accelerated vibrator according to claim 15 wherein said threaded recess is sized and shaped to receive a correspondingly threaded stem that releaseably closes off said threaded recess.

18. An asymmetrically accelerated vibrator according to claim 15 wherein said ball-valve is formed from a light weight, wear and corrosion resistant material.

19. An asymmetrically accelerated vibrator according to claim 18 wherein said threaded stem includes a radiused bottom end and a central passageway arranged in fluid communication with an opening located within threads disposed upon an outer surface and a semi-circumferential slot which intersects with said opening.

20. An asymmetrically accelerated vibrator according to claim 19 said threaded recess comprises a radiused seat-wall has a centrally defined through-bore that provides for fluid communication with a central passageway defined in the interior of said threaded stem.

21. An asymmetrically accelerated vibrator according to claim 20 wherein said radiused seat-wall comprises a curvature that is complementary to a spherical ball-valve.

22. An asymmetrically accelerated vibrator according to claim 15 wherein said first open-ended chamber and said second open-ended chamber are arranged

in spaced apart coaxial relation to one another, and in substantially parallel relation to said compressed fluid conduit.

23. An asymmetrically accelerated vibrator according to claim 15 wherein said first open-ended chamber comprises a smaller diameter than said second open-ended chamber, and a feed-bore fluidly communicates between said compressed fluid conduit and said first open-ended chamber, and in spaced relation to said threaded recess.

24. An asymmetrically accelerated vibrator according to claim 23 wherein said through-bore of said threaded recess communicates with said first open-ended chamber upon movement of said ball-valve.

25. An asymmetrically accelerated vibrator according to claim 15 wherein an open-ended passageway is defined in a lower portion of said case, and is disposed in substantially parallel, spaced relation to said first and second open-ended chambers, and an exhaust-bore is defined in said case adjacent to an end of said open-ended passageway so as to fluidly communicate between said second open-ended chamber and said open-ended passageway.

26. An asymmetrically accelerated vibrator according to claim 15 wherein said second piston includes a valve positioned within said second open-ended

chamber, and comprising a substantially cylindrical, open-ended profile defined by an annular outer wall and a bottom wall.

27. An asymmetrically accelerated vibrator according to claim 26 wherein said annular outer wall includes a lead-in portion having an outer surface and a ball-valve-actuator that projects radially outwardly from said outer surface.

28. An asymmetrically accelerated vibrator comprising:

- a case having a first bore and a second bore arranged in coaxial relation to one another and in regulated fluid communication with a source of compressed fluid;
- a first piston having a first diameter disposed in said first bore;
- a second piston having a second diameter disposed in said second bore and including a compound valve positioned within said second bore, and comprising a valve-actuator projecting therefrom, said valve-actuator including a chamfered end;
- a mechanical connection between said first and second pistons such that said pistons are caused to oscillate in unison by regulated application of compressed fluid from said compressed fluid source; and
- a ball-valve disposed in fluid regulatory relation between said first bore, said second bore, and said source of compressed fluid so as to switch a flow of said



compressed fluid between said first bore and said second bore upon interaction with said chamfered end.